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STUDENT RESEARCH REPORT

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SOVIET TACTICAL DOCTRINE AND CAPABILITIES FOR WARFARE AT NIGHT AND UNDER CONDITIONS OF LIMITED VISIBILITY
-1974-

GARMISCH, GERMANY

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(6) SOVIET TACTICAL DOCTRINE AND CAPABILITIES FOR WARFARE AT NIGHT AND UNDER CONDITIONS OF LIMITED VISIBILITY.

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FOREWORD

This research project represents fulfillment of a student requirement for successful completion of Phase III Training of the Department of the Army's Foreign Area Officer Program (Russian).

Only unclassified sources are used in producing the research paper. The opinions, value judgments and conclusions expressed are those of the author and in no way reflect official policy of the United States Government; Department of Defense; Department of the Army, Office of the Assistant Chief of Staff of Intelligence; Department of the Army; or the U.S. Army Russian Institute.

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DEDICATION

I would like to acknowledge my deep appreciation and indebtedness to Doctor Arthur G. Volz, formerly of the USAREUR Technical Intelligence Center, for the help he has rendered me in the preparation of this paper. Doctor Volz is one of the most outstanding intelligence professionals it has been my pleasure to meet, and he has done much to develop cognizance in the West of the first-rate equipment of the Soviet and Warsaw Pact armies.

SCOPE

This study examines Soviet tactical doctrine for the conduct of military operations during periods of darkness, and, to a lesser extent, under conditions of limited visibility (fog, rain, snow or the use of smoke). Soviet tactics and special techniques for night combat are developed in detail for battalion through squad level offensive and defensive operations. Soviet training techniques are scrutinized for an indication of the Soviet "state of the art," and particular attention is given to Soviet technical aids for night combat. Finally, an effort is made to compare Soviet capabilities with those of the United States Army and to assess the significance of these Soviet abilities in any future ground conflict.

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CHAPTER I

THE RELEVANCE OF NIGHT COMBAT TO MODERN WARFARE

Prior to World War II, the night attack was regarded as an extremely difficult and hazardous undertaking possessing negligible tactical value and enjoying little probability of success. This view changed radically, however, as during the war night attacks were increasingly used with better and better effect to secure first limited, and then somewhat more ambitious objectives in less time and with less casualties than would have been inflicted during the day. Night attacks were used in all threatres of World War II, and during the Korean Conflict night assaults became almost routine, especially after the Chinese Communists entered the struggle. During the Cassino-Venafro campaign in Southern Italy during World War II, for example, one American infantry division conducted more than half of its total combat operations at night.[1] At El Alamein, General Montgomery, in one of the most carefully planned night attacks in modern military history, deployed an entire British army to smash Rommel's Afrika Korps.[2]

During "The Great Fatherland War" (World War II), the Soviet Army too made widespread use of darkness to conduct a variety of operations ranging from the regrouping and concentration of forces for major offensives to pursuit operations which exploited successes initiated during daylight hours and denied withdrawing German forces the possibility of organizing defenses. The Soviets also made extensive use of the cover of night for re-supply operations.[3] The last major Russian effort of the war, the drive on Berlin, was launched by a night assault across

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[1] ROTCM 145-60, Small Unit Tactics (Washington: Headquarters, Department of the Army, June 1964), p. 167.

[2] Ibid.

[3] B. Krzhivskii et al., Nochnoi Boi (Night Combat) (Moskva: Voennoe Izdatel'stvo, 1963. This is an abridged translation of a Czech work first published in Prague in 1960. Although not completely up to date, this is a valuable, comprehensive treatment of the subject.

the Oder River by three Soviet fronts,[4] and most of the Soviet Army's numerous opposed water crossings occurred under the cover of darkness.[5]

While the major thrust of this paper concerns Soviet tactical doctrine for night combat, warfare under periods of reduced visibility -- fog, rain, snow or the use of smoke -- is an ancillary consideration which is developed alongside the major topic to the extent possible.

Today's Soviet military leaders attribute great importance to the ability to continue operations begun during the day throughout hours of darkness. This is not only demanded in regulations, but is more than amply underlined in the Soviet military press by numerous articles which stress that such ability is required in particular under conditions of nuclear warfare and the widespread use of mass destruction weapons:

> The resolute and highly maneuverable characteristics of modern combat, the striving of both sides to defeat the enemy with minimum losses and in the shortest possible time -- all this makes it incumbent on subunits to carry out combat actions continuously, by day and night. Night cannot be a reason for decreasing activity. On the contrary, the dark of night is used to achieve surprise, increase the rates of advance, and win time. Continuous combat actions by subunits at night are therefore becoming an objective necessity, and night action the usual type of action.[6]

Another exposition on the subject appearing in the Soviet press declared:

> Soviet military theoretical science, exploiting the rich experience of the Great Fatherland War and the post-war development of armed combat, attaches considerable significance to night combat operations. The appearance of nuclear-armed missiles and other destructive means, as well as radar, infrared, and other apparatus, has significantly increased the possibility for night combat....Night offensive actions and actions under reduced visibility make

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[4]Cornelius Ryan, The Last Battle (New York: Simon and Schuster, 1967), p. 331.

[5]MAJ L. Chyzankov, "Cherez Vodnuiu Peregrady Noch'iu" (Across Water Obstacles at Night), Voennyi Vestnik, June 1971, p. 44.

[6]COL I. Vorobyov, "Night Offensive," Soviet Military Review, July 1972, p. 13. (Emphasis added.)

possible the attainment of surprise, create conditions for the destruction of the enemy by smaller forces and with fewer losses.[7]

There can be no doubt of Soviet interest in this aspect of modern combat: there has been a long series of articles covering almost exhaustively nearly every aspect of night-time action appearing in Voennyi Vestnik and Soviet Military Review over the past four years, and "Night Training of the Armed Forces" (Nochnaia Podgotovka Voisk) will be one of four special themes to which an entire issue of Voennyi Vestnik will be devoted during 1974.[8]

For all their stress on night operations, Soviet leaders do not hesitate to point out that night combat is fraught with difficulties which can be overcome only by dint of thorough training and preparation. As one Soviet colonel has written,

> Alongside high field training standards, great importance is attached to psychological training for ensuring success of [night] combat actions. Night actions require vigor, self-control, and resourcefulness. Commanders must be able to find their bearings quickly in a complicated situation and mobilize the fighting men's will to carry out the assigned mission.[9]

Reduced vision with its ensuing difficulties in orientation and observation is an obvious problem area during night combat. Terrain features and distance perception are distorted, while the psychological and physical condition of troops is usually strained during night combat. Without extensive training and experience in night combat, this altered perception of surrounding phenomena could lead to panic. In particular, after the intensive light of a nuclear fireball, the following darkness could give troops a false impression of blindness. Moreover, after a hard day of combat, exhausted troops are more prone to map-plotting and other errors. One Soviet publication correctly points out that even infrared devices don't eliminate the

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[7]COL V. Vinnikov, "Uchit'sia Voevat' Noch'iu" (Learn to Fight at Night), Voennyi Vestnik, February 1971, p. 104.

[8]"Voennyi Vestnik in 1974," January 1974, p. 121. The other three themes are "Forcing of Water Obstacles," "The Meeting Engagement," and "Commanders' and Methodological Training of Officers."

[9]Vorobyov, op. cit., p. 143

difficulty of correctly perceiving terrain features since they only provide a one-dimensional and achromatic view.[10]

Of course, the length and degree of darkness depend on the latitude of the combat area, the stage of the moon, time of year, and weather conditions. The length of night at "average" latitudes during the summer months is only 4.5 hours, during fall this increases to 9-12 hours, and reaches 14-16 hours during the winter months.[11] Nights become darker as one approaches the equator, and are almost non-existent at the two poles during the summer months.

Besides the difficulties already mentioned, Soviet writers concede that reduced visibility hampers the commander's effective control of subunits, and makes quite difficult the maintenance of continuous, coordinated action. Other complications are encountered in reconnaissance, determining a target's coordinates (along with target location in general), coordinating of aimed fires, and close-in employment of nuclear weapons.[12]

How the Soviets attempt to overcome these difficulties will be discussed in detail in the following chapters, but it is perhaps well to point out at the outset the contradictory demands and statements made by Soviet writers discoursing on the topic, one of their favorites. To overcome the effects of darkness, Soviet forces have historically made, and will continue under certain conditions, to make extensive use of artificial illumination means -- searchlights, flares, artillery and aviation-delivered illuminating rounds -- to "blind" the enemy while facilitating Soviet movement. But this is something they would prefer to avoid, since not only is surprise somewhat reduced, but areas illuminated for Soviet eyes are also lit up for their enemy.

While speaking of offensive operations, Soviet writers extole advantages in the securing of surprise, masking of intentions, the ability to close with the enemy without being detected.

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[10] COL V. K. Shamshurov, Inzhenernoe Obespechenie Boevykh Deistvii Noch'iu i v Osobykh Usloviakh (Engineer Support of Combat Operations at Night and under Special Conditions) (Moskva: Voennoe Izdatel'stvo, 1969), p. 6.

[11] Ibid.

[12] LTC B. Nazarenko, "Batal'on Nastupaet Noch'iu," (Battalion Attacks at Night), Voennyi Vestnik, January 1972, p. 7.

On the other hand, when Soviet forces adopt a defensive posture during hours of darkness, they discount similar advantages for the enemy and emphasize the hardship for the enemy of moving over unfamiliar terrain. Several more contradictions might be listed, but the point here is that much of Soviet "doctrine" as reflected in the military press is of an exhortative nature, designed to arouse the Soviet officer and soldier to the greatest effort possible to exploit periods of darkness. There is no doubt some considerable divergence between doctrine as such and the actual capabilities of Soviet troops to carry out its demands.

CHAPTER II

TACTICS

A. OFFENSIVE OPERATIONS

Soviet tactical doctrine places primary emphasis on combined arms action during night combat, emphasizing that the special demands of limited visibility require that the various branches of arms support each other to the maximum extent possible. Thus, after examining some general considerations, this study of Soviet tactics will begin with the basic Soviet combat branch, motorized rifle (in Western parlance, mechanized infantry), but of necessity the interacting nature of the various arms' duties will be reflected as doctrine is developed on each arm in turn.

Soviet night-time operations are by no means limited to small-unit assaults with limited objectives; divisional and higher level operations will not be unusual.[1] The final Red Army drive on Berlin in the spring of 1945 serves to illustrate this point: a Soviet force consisting of three fronts supported by tactical aviation, 10,000 mortars and artillery pieces, and thousands of tanks broke through German defenses after an assault across the broad Oder River which began at 4 a.m.[2]

Great numbers of searchlights were employed in this Russian offensive and the Nazis found them to be a potent weapon in the Russian arsenal. Soviet planners are well aware, however, that artificial night illumination devices generally assist enemy units as well, and prefer to conduct the bulk of night operations using more modern means - IR, navigational plotting devices, etc. This does not mean that Soviet forces do not continue to have numerous searchlight units at their disposal, as well as plentiful illuminating rounds for mortars and artillery. They stress that such means are employed most

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[1] B. Krzhibskii, I. Kiesken', V. Nermaier, Z. Gradetskii, Nochnoi Boi (Night Combat) (Prague: Nase Vojsko, 1960, translated and published by Military Publishing House, Moscow, 1963, pp. 46, 47.

[2] Cornelius Ryan, The Last Battle (New York: Simon and Schuster, 1967), p. 331.

advantageously to "blind" the enemy once actual contact with enemy units has been achieved. Illumination devices are used only periodically, for short periods, prior to this time. To aid troop orientation, attempts are made to start fires within the center of enemy defensive belts, and extensive use is made of flares, lanterns and various markers to indicate routes of advance. Prior to the assault, safe lanes through enemy or friendly mine fields will be cleared by engineer troops and delineated by luminous or other markers.

Soviet writings stress that no pattern should be established for timing of night offensive operations. Their doctrine states that the time is determined primarily by a units' subsequent missions, so that more often than not, the assult will be initiated several hours after sunset. Pre-dawn assaults are not preferred because, generally, reconnaissance and preparation would have to be conducted in the dark, not always insuring success.[3] When possible, Soviet commanders are supposed to carry out their reconnaissance of enemy dispositions twice - first during daytime, and secondly, at night, to determine whether enemy defenses have been realigned.

Soviet commanders at all levels work out detailed plans of attack, insuring mutual support of adjacent units. Maneuver is kept as simple as possible, since the Soviets are well aware that darkness itself complicates contemplated operations. However, whenever possible, the Soviets will attack enemy forces from the flank and rear. Phase lines, usually indicated by prominent terrain features, are used for control purposes, and units use flares or other means to signal arrival at various phase lines or landmarks during approach to contact.

During periods of reduced visibility, reserves follow closely behind front-line units in contact to reduce the possibility of destruction of second echelons by enemy nuclear strikes. Generally, the assaulting element is expected to accomplish its mission without the aid of reinforcements. Second echelon regiments and divisional or higher units may be

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[3] B. Krzhibskii, et al., op. cit., p. 50.

employed, however, to exploit a penetration of the enemy FEBA, or when the first echelon units are engaged in repulsing a counter-attack or securing key terrain.

According to Soviet military theorists, night-time rates of advance may be identical to similar daytime operations on well-lit nights. However, under conditions of extreme darkness, progress may be as little as half that of day. Using night vision devices and artificial illumination, however, Soviet doctrine holds that well-trained units can attack with the same tempo over the same distances as are possible during daylight.[4] It is obvious that Soviet doctrine is not completely consistent on this point, and is designed to exhort commands to the greatest possible effort.

A. Motorized Rifle. At this point it may be useful to examine several examples of night combat deployment at motorized battalion, company, platoon and squad levels. Unfortunately, no Soviet sources could be found detailing preparations and tactics for larger units.

Once a battalion CO receives a night attack mission, he immediately issues a warning order to his subordinates. Normally, he will report directly to the regimental commander to receive quite detailed instructions, after which a leaders' visual reconnaissance is normally conducted 500-1000 meters into enemy-held territory, depending on the availability of good vantage points in friendly-held territory. During this time, under supervision of the battalion Chief of Staff (XO), subordinate commanders check night vision devices, inspect equipment, and take on supplies, including flares and illumination and tracer rounds. Once the battalion CO returns from the regimental meeting, his subordinates assemble at a pre-designated area for a detailed survey of the unit's zone of responsibility. Definite boundaries are indicated for each sub-unit to minimize confusion. Each unit is also assigned an azimuth for its final assault, which at night is almost always accomplished on foot.

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[4] Ibid.; p. 58, 59; COL I. Vorobyov, "Night Offensive," Soviet Military Review, June 1972, p. 14; and LTC B. Nazarenko, "Batal'on Nastupaet noch'iu" (Battalion Night Attack), Voennyi Vestnik, January 1972, p. 7.

Normally, a motorized rifle battalion will be reinforced with at least an artillery battalion and tank company, plus an engineer platoon and CBR section. If the situation warrants, anti-aircraft and anti-tank units may additionally be attached. Artillery batteries may be assigned support missions to definite motorized rifle companies.

Prior to departing the assembly area, personnel normally tie on white armbands so that recognition problems will be minimized. Tanks and APC's are demarked with various white or luminescent panels or numbers on their rear surfaces or turrets, so that each sub-unit can easily recognize the vehicles assisting in its assault.

During the tactical march to the FEBA, Soviet drivers make continuous use of their night vision devices and intervals between vehicles are less than is standard for daylight marches. Obviously, this will entail movement at speeds lower than during the day. As already mentioned, along the FEBA use of IR devices is restricted to short, periodic bursts to avoid giving away positions to enemy reconnaissance. Radio silence is maintained during this period, as the Soviets are extremely conscious of radio security. Sets are placed in the receiving mode and constantly monitored should there be urgent information directed their way.[5] However, once their initial objectives have been seized, they are also required to radio this to their superiors.

Motorized riflemen generally dismount from their APC's in pre-selected company disembarking areas and march in columns of twos to their platoon release points. Machine gunners armed with RPK light machine guns are first in the squad march order, followed by the squad leader, the grenadier (RPG grenade launchers), and the remaining squad members (AKM assault rifles).

A red light on the rear of every tank facilitates navigation for the riflemen as they approach their assault position. Here they deploy without pause on line and, delivering fire on the move, begin the final assault. Squad leaders position themselves

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[5]Nazarenko, op. cit., p. 11.

in the center of their formation for more effective control. APC's follow and support the attack with their machine guns, moving to platoon objectives as soon as they are consolidated. As rapidly as possible, squads remount their carriers to pursue retreating enemy elements -- contact is maintained to lessen enemy opportunity to deliver nuclear strikes or bring in artillery concentrations.

A Soviet motorized rifle battalion attacks with all three of its companies on line, with supporting tank, CBR, and engineer units and sometimes artillery attached to each company. The battalion commander will normally retain at most a reinforced platoon as reserve. Here Soviet doctrine seems to rely on its large numbers of formations which could be drawn from successive echelons to blunt any enemy breach of forward combat dispositions. In the event of an enemy counter-attack, Soviet doctrine envisions the commitment of reserves to deliver an assault on the enemy's flanks and rear in an effort to encircle the counter-attacking forces. After the counter-attack has been repulsed, Soviet forces resume the pursuit at once. The Soviet publication Night Combat mentions that less forces are required for this at night than are needed in the daytime. Reserves and second echelon forces available will exploit and develop ruptures in the enemy battle order, particularly along axes astride boundaries between enemy units, to drive deep into the enemy rear and encircle the greatest size forces possible.

B. Tanks. On bright, moon-lit nights or when artificial illumination or night vision devices are employed, tanks assault just ahead of the riflemen. Under conditions of more limited visibility, tanks will position themselves on line with the infantry so that the vehicles are not unnecessarily exposed to destruction during close combat. At least under some conditions, engineers may be detailed as guides to lead tanks to their assault positions. Normally, the course is determined by the tank's directional gyro*, which according to Soviet testimony, is rather reliable, at least where the terrain is relatively flat

*See Chapter IV, "Technical Aids for Night Operations."

and clear of obstacles. It must be noted that at least five minutes are required to prepare the gyro for functioning; this of course is done in an area somewhat to the rear line of departure. As mentioned, a small red light on each tank's rear serves as a beacon for the assaulting infantry to guide on.

However, one Soviet article described a battalion night training exercise during which one of the tanks became bogged down in a shell crater. A recovery vehicle sent to the rescue managed to get lost and couldn't find the vehicle in distress and the commander of the recovery unit was finally forced to personally supervise the tank's recovery,[6] causing one to wonder somewhat about the Soviet night-time cross-country movement capability.

Navigation is not the least of the tanker's problems during night combat -- acquiring and ranging targets is considerably more difficult than during daylight. Even the act of changing from day to night sights helps complicate matters, as their magnification is different. Crew members' night vision can be temporarily destroyed for 10-15 seconds both by muzzle flash or exploding rounds, making fire adjustment difficult. Finally, ballistic conditions change at night and must be recomputed, not always under the most desirable conditions in a darkened fighting compartment. Much is written of this by Soviet authors, but if one can place any credence in Soviet accounts of the results of their training exercises, considerable accuracy at night can be obtained by well-trained gunners. One article mentioned that 100% of artillery targets were destroyed and 78% of the enemy machine gun emplacements engaged on a night firing exercise were hit.[7] Another article indicated that targets out to 3,100 meters were being engaged, although this was accomplished using the daylight scope and "simulated battlefield illumination."

The Soviet use two techniques to range on enemy weapons using IR sights: either two tanks determine the azimuth to the target and then compute its range using triangulation, or the

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[6]Engr. LTC B. Gruzdev, "Tekhnicheskoe Nabliudenie v Nochhom Boiu" (Technical Observation in Night Combat), Voennyi Vestnik, February 1971, p. 109.

[7]COL A. Krylov, "V Usloviiakh Ogranichennoi Videmosti" (Under Periods of Reduced Visibility), Voennyi Vestnik, July 1973, p. 90

target is engaged with the tank's co-axial machine gun which is adjusted until it is "on target." If firing is being carried out by a sub-unit, the fire of one tank is sometimes adjusted by a neighboring crew.

During the assault, Soviet tanks are taught to fire either while on the move or from a short halt, as they realize that once the main gun is discharged, the muzzle flash provides an excellent target for the enemy to range on. For direct fire at shorter ranges, or when the co-axial machine gun and night sight are used to adjust fire, fire while on the move is preferred. For longer distances requiring indirect fire when the day-time scope is being used, Soviet tankers employ the short halt, or even longer halts. They assault as a rule in a straight line since they are following an azimuth; if they must divert course to avoid an obstacle of some type, they must resume their previous course as soon as possible.

C. Artillery. Normally, a Soviet night assault will be preceded by a heavy artillery preparation, although this can be omitted if enemy defences are perceived to be so weak that an attack by stealth is warranted. One article noted that such operations were frequent during World War II, but stated that in modern combat normally such a "noiseless" attack would be attempted only to "fulfill local missions along separate lines of advance when the offensive is carried out by limited forces in adverse weather conditions (fog, snow, storm or rain)."[9]

Aside from continuing to serve as the principal means of fire support, Soviet artillery has several additional functions during night combat. The artillery battalion attached to a motorized battalion for a night offensive may be directed to fire incendiary rounds upon pre-selected enemy targets, thus facilitating the attacking forces' navigation. Another characteristic mission is that of providing illumination -- periodically, for short periods of time during key stages of

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[8]LTC L. Iaremenko, "Strel'ba na Porazhenie Noch'iu" (Destructive Fire at Night), Voennyi Vestnik, May 1973, p. 68.

[9]COL I. Vorobyov, "Night Offensive," Soviet Military Review, June 1972, p. 14.

combat, or during the entire operation. Continuous illumination would occur, as a rule, only once engaged in fighting for key objectives or to repulse enemy counterattacks. Artillery will also be immediately called upon to fire upon detected enemy IR sources, or, on well-lit nights, may be directed to lay a smoke barrage to "blind" enemy defenders. Under periods of reduced visibility, smoke will also be used as marking rounds to adjust fire.[10]

Soviet artillery commanders seemed more concerned than others about cross-country movement at night; one source openly asserted that because of difficulties characteristically encountered, CP's and firing positions ought to be situated close to roads. One writer mentioned that, depending on various conditions, an artillery battalion's movement at night would be limited to between 20 and 40 kmph.[11] Other problems encountered at night are difficulty in selecting and surveying firing positions, target reconnaissance, fire adjusting and redeployment to new firing positions. Because of this, whenever possible, artillery units are emplaced during daylight and firing data is prepared in advance on all probable targets or enemy axes of advance.

Artillery commanders are co-located with the commanders of supported units for night-time operations, with fire control being decentralized. This is especially apparent in the case of Soviet artillery employed in the direct-fire role. "Accompanying artillery" (artillerila soprovozhdenila), equipped with IR sights, is attached to front-line motorized rifle companies to insure the repulse of counterattacks and destroy tanks and enemy strong points.

Several interesting aspects of Soviet night-time instrumental reconnaissance or target acquisition (Soviet artillery employs optic, sound, radar, topographic, meteorological and even ground reconnaissance means) include the use of pictures which may reflect only muzzle flashes or other battlefield illumination.

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[10] LTC L. Iaremenko, "Strel'ba na Porazhenie Noch'iu" (Destruction of Targets at Night), Voennyi Vestnik, May 1973, p.6

[11] COL A. Rodin, "Night March," Soviet Military Review, March 1972, p. 22.

They are compared with photographs taken of the same area at daytime to aid in establishing firing data. During artificial illumination (flares or searchlights), optical reconnaissance may extend out to several kilometers; it is also conducted with IR equipment, but here the range would be much more limited.

Muzzle flashes and the like can be ranged out to 10 kilometers by triangulating the azimuths shot by aiming circles at several optical positions.

Sound ranging is one capability which improves at night; the Soviets estimate that it is as much as twice as effective at night than during daylight, due to sound propagation characteristics. Data charts are prepared in advance for various distances based on three variations in air temperature.[12]

Soviet artillery radar is used to detect range moving targets or large objects which extend above the general terrain surface. They are of course also used for counter-battery fire and to locate enemy radar, as well as to determine ground zero of nuclear bursts.[13]

D. Anti-Aircraft Artillery. Anti-aircraft artillery positions are equally difficult to establish at night, and they are thus generally located along roads, unless pre-positioned during daylight hours. At night, aviation and AA units are assigned separate sectors of defense to minimize the possible infliction of damage on friendly forces. AA units also have the mission of destroying enemy illumination "bombs" lighting Soviet troop concentrations.[14]

E. Sappers/Engineers. Engineer troop employment at night is characterized mainly by de-centralization; sub-units are attached to motorized rifle companies and even platoons. Use of construction equipment and the hauling of demolitions generally take place at least 1.5 or 2 kilometers behind front lines.[15]

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[12] LTC M. Moaharov, MAJ B. Krupenin, "Kompleksnoe Zaniatie C Batareei Noch'iu" (Combined Training with a Battery at Night), Voennyi Vestnik, February 1971, p. 53.

[13] B. Krzhivskii, et al., op. cit., p. 68.

[14] Ibid.

[15] COL V. K. Shamshurov, Inzhenernoe Obspechenile Boevykh Deistvii Voisk Noch'iu i v Osobykh Uslovilakh (Engineer Support of Combat Troops at Night and Under Special Conditions) (Moskva: Voennoe Izdatel'stvo, 1969), p. 9.

Although combat reconnaissance engineers (sappers) are equipped with night vision devices and signal lamps, in many cases it will be necessary to illuminate the battlefield to fulfill their mission. Prior to the assault, one or two engineer observation and listening posts consisting of 3-4 sappers are established forward of each motorized rifle battalion. At night listening posts may be increased and moved closer to enemy lines; when possible, sapper-linguists will attempt to gain combat intelligence on the opposing forces.[16]

Before the assault, often during the artillery preparation, sappers will clear paths through Soviet minefields by hand, but normally they will use demolitions or roller-equipped tanks to clear safe lanes through enemy fields -- on a battalion front, up to six 6-8 meter-wide gaps.[17] A Soviet authority on engineer operations at night has stated that whenever possible obstacles and minefields will be reconnoitered during the latter half of the period of darkness, since ground fog which generally arises then helps provide cover for the sappers. As already mentioned, routes for the assaulting forces are marked by reflectorized lumenescent markers emplaced by engineers. Each engineer squad is issued up to 50 lengths of Bangalore torpedo and 25-35 markers.[18]

Damage to key roads in the attack area is repaired by composite "movement maintenance detachments" (otriady obespecheni dvizhenila, OOD), which normally include a CBR section or squad. OOD's clear the road of damaged equipment and mark obstacles or restricted passages along the route.

Although river crossing operations are considerably complicated at night, during World War II the Soviet Army accomplished the majority of its assaults across water obstacles under cover of darkness,[19] sometimes on staggering scales, as in

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[16] COL V. Shamshurov, "Inzhenernoe Obespechenie Nastuplenila Noch'lu (Engineer Support of the Attack at Night), Voennyl Vestnik, September 1970, p. 87.

[17] Ibid.

[18] Ibid.

[19] MAJ L. Chyzavkov, "Cherez Vodnulu Peregrady Noch'lu (Across Water Obstacles at Night), Voennyl Vestnik, June 1971, p. 44.

the example cited at the beginning of this chapter. However, preparation and reconnaissance begin during daylight hours, even if aerial reconnaissance is the only method possible.

Soviet forces will attempt to force crossings in weakly defended areas, when possible, and will attempt to misrepresent their actual plans by conducting feints against strongly-held areas. Normally, a river crossing will be preceded by a heavy artillery preparation, or, in a nuclear environment, following a nuclear strike on heavily defended points.[20] It should also be remembered that the Soviet basic assault crossing doctrine of crossing in strength at multiple points will also be applicable at night. While the assault is in progress, APCs and PT-76 amphibious tanks can be fired while swimming, as can the main guns of medium tanks being transported on GSP or pontoon ferries. Correspondingly numbered points will be emplaced by engineer troops on both banks to aide in navigation. Chimneys of snorkeling tanks will be marked by luminescent markers (visible from the Soviet bank only) to assist in command and control. Once the far bank has been seized, Soviet units continue the assault without interruption to deny enemy forces time to regroup or prepare defenses or a counterattack.

However, if the Soviet advance is stopped by enemy counterattack, the engineers will emplace hasty minefields using PMR-60 mine-emplacing trailers and other mechanical equipment. They will also demolish any prominent terrain features which could assist enemy orientation.

F. CBR Defense. Since at night it is more difficult to determine sectors of radioactive and chemical contamination, or even detect enemy use of such means, the work of CBR troops is also greatly complicated during periods of darkness, especially if they must operate wearing protective clothing and masks. CBR troops mark the limits of contaminated areas with special symbols but if by-passing is not possible, they are crossed in directions and on routes having the minimum dosages and providing the highest rates of advance in the darkness.

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[20] Ibid., p. 46.

At night, the "dazzle effect" of nuclear bursts is greatly increased as the pupils of the human eye are 50-60% wider.[21] Commanders and vehicle drivers are most vulnerable, and for this reason, 2-3 alternate drivers are designated to wear protective glasses during the march when the enemy has been known to employ nuclear weapons. All units are given timely warnings of Soviet nuclear strikes so that they can take protective measures, which may include the laying of smoke screens.[22] CBR specialists are assigned down to company and platoon level, but all units are supposed to have personnel trained in basic CBR defense procedures.[23]

The Soviets prefer to decontaminate equipment in "special processing points" (raiony spetsial'noi obrabotv, RSO) near inhabited areas, since a certain amount of illumination is unavoidable to complete the procedure. In all cases RSO's must be easily accessible to front-line troops and near the road. Because of the large quantity of liquid solutions dispersed from ARS-12U or ARS-15 decontamination vehicles, RSO's usually cover a large area. One article mentioned the danger of vehicles becoming "bogged down" during the process, probably a recurrent problem when large numbers of troops must be treated.

G. Logistics. Considerable attention during night operations must be devoted to logistical support; one Soviet source mentioned that requirements increase by from 15 to 30% during nighttime.[24] For operations planned to begin in the first half of the night, munitions should be brought to participating artillery units a day or two previously. Even combat troops demand more ammunition, and an APC is normally designated in each company for resupply from the battalion.

It goes without saying that medical evacuation is also more difficult at night. During World War II, Soviet forces used trained dogs to locate wounded soldiers and a recent publication

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[21] COL M. Prostomolotov, "Osobennosti Zashchity Nochi'iu" (Peculiarities of Defense at Night), Voennyi Vestnik, February 1972, p. 87.

[22] Ibid.

[23] B. Krzhivskii, op. cit., pp. 73-76.

[24] Ibid., p. 88.

recommended their continued use. Heavy or mass casualties could overwhelm the Soviet medical system at night, since their normal doctrine is to evacuate wounded troops under cover of darkness.[25]

H. Command, Control and Signal. From all that has previously been mentioned, it is obvious that command and control is greatly complicated by the fluid and often uncertain nature of night combat. Regimental and higher commanders often experience information time lags, which along with the character of night actions themselves, place far higher requirements on subordinate commanders to display initiative than has been customary in the Soviet Army. But even intermediate commanders experience hardship in ascertaining their subordinates' current disposition. One interesting Soviet solution to the problem of establishing the whereabouts of the latest front line trace is a technique whereby forward tanks and APC's are directed by radio to momentarily switch on their rear lights.[26] The commander may also attempt to remain abreast of the situation by employing night vision devices, radar, and television; in any case, Soviet doctrine insists that they ought to be as close as practical to the front-line troops.

Unfortunately, very little has appeared in the Soviet press concerning tactical peculiarities of Soviet communications troops at night. One handbook on night operation did stress that despite the evident difficulties, wire communications should be established at night to provide commanders alternate channels of communications with subordinate, superior and adjacent units. The time required for laying cable is roughly doubled at night.[27] Planes and helicopters are also used to convey reports - and presumably for urgent resupply missions as well.

Soviet nighttime offensive plans include provision for replacement units from reserves and second echelons to continue the assault at dawn, or whenever the situation so dictates.

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[25] Ibid., pp. 87, 88.

[26] Ibid., p. 92.

[27] Ibid., p. 91.

Soviet planners are quite cognizant that night combat is a physically draining experience, especially if the assault began shortly after nightfall. Means are also allotted to rapidly restore control, coordination and communications disrupted during darkness so that possible enemy counterattacks do not negate the night's results, or, whenever possible, so that the advance can continue without respite for their opponent.

B. DEFENSIVE OPERATIONS

Even the Soviet Army finds that it will at times be necessary to conduct nighttime defensive operations. Indeed, one book stated that night defense will occur as frequently as the night attack.[28] However, the number and detail of papers describing night defense is considerably less than treatments of the night attack.[29]

Certainly not in the same breath while listing the advantages of the night assault, the Soviets find that night defensive operations have a series of positive aspects: orientation and maneuver are much easier on familiar ground which at the same time is foreign to the enemy; positions and maneuvers can be planned and prepared during daylight; concealment and camouflage of dispositions and fire support means are easier, and counter-attacks, even by small forces, have greater effect since the enemy is blinded and often uncertain of the actual situation.

Soviet theoreticians do concede that limited visibility does give certain advantages to enemy forces, who can redeploy under cover of darkness and deliver sudden blows upon defenders. Limited vision hampers command and control, forcing subordinate commanders and individual soldiers to display greater initiative, especially when enemy forces penetrate into the depths of Soviet defenses. Finally, aimed fire is greatly hampered, and in some cases all but impossible. For these reasons, Soviet units in the night defense generally conduct illumination of the

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[28] Ibid., p. 111.

[29] I found only three sources which covered this topic in any detail.

FEBA at irregular intervals to detect enemy movement. And almost without exception, night defensive preparations will begin during the preceeding day.

During hours of darkness, reserve and second echelon units are, as a rule, positioned closer to the front line so that they may be rapidly deployed to threatened areas, or to cover defensive gaps left by enemy nuclear strikes. To avoid destruction by nuclear bursts, the Soviets teach that troop dispositions should be periodically shifted and large concentrations avoided to deny the enemy lucrative targets. In any event, second echelon artillery will, whenever possible, support troops on line who are under attack.

Motorized rifle troops reinforced with tanks are again the backbone of the Soviet defensive formation. Their mission is thus formulated: "to repel by overwhelming fire and counter-attack enemy infantry and armor attacks, to inflict heavy losses, and to hold the position occupied."[30]

Under conditions of darkness, patrols are dispatched forward of the battle area and in gaps between strong points. Trained dogs, when available, are also used to detect enemy presence.[31] IR observation posts are also established, and within each platoon several soldiers are designated to detect and destroy enemy IR sources. Listening posts are established far forward, and combat outposts are established with the mission of engaging enemy forces and forcing him to deploy prematurely into combat formation. They are usually located in ravines or other depressions, since at night visibility upwards is better than in the reverse direction. Enemy forces crossing hill crests and other rises are thus silhouetted and readily spotted.

Prior to nightfall, motorized troops of course dig in, and machine gunners, grenadiers, and riflemen mark with pegs their primary and secondary fire sectors and directions of fire. Positions are selected to preclude "dead" areas.

Tanks are frequently dug in as well, but will always have pre-designated alternate positions to repulse assaults from the

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[30] Ibid., p. 119.

[31] Ibid., p. 120.

flanks and rear. Routes from primary to alternate emplacements are surveyed and marked by luminescent devices beforehand. Zones of fire for each platoon are delimited by terrain features which stand out in relief against the surrounding background, as are sectors of concentrated fire. Detailed fire data is prepared so that concentrations can be delivered along probable approach routes without the use of night vision devices.[32]

Prior to periods of darkness, tanks from reserve units are frequently moved up into weakly defended areas, especially along unit boundaries and astride probable enemy attack axes.

At night, artillery is advantageously employed in a direct fire role against assaulting enemy armor. "Artillery ambushes" are also set along roads to destroy elements which penetrate forward defenses. A significant portion of available artillery will also be earmarked to an anti-tank reserve. Artillery also conducts vigorous counter-battery fire and attempts to destroy any targets of opportunity which may be detected. Concentrations will be plotted along likely avenues of approach, and plans drawn up not only for final protective fire, but also fire upon friendly positions in the event they are overrun.[33] Prior to nightfall, artillery units will reconnoiter alternate positions which will be occupied in the event that retrograde movement is necessary.

For night defensive operations, Soviet engineer troops undertake elaborate camouflage measures, such as the erection of screens and shields to mask Soviet dispositions from enemy radar.

Engineers will be called upon to construct fortifications and dig entrenchments and they will lay minefields forward of these defensive positions. Insofar as this is possible, the above actions will not be accomplished at night, since,as already mentioned, sound carries up to twice as far at night.

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[32]MAJ Z. Averyanov, "From March into Action," Soviet Military Review, July 1972, p. 16.

[33]Krzhinskii, et al., op. cit., p. 122.

The Soviet data for the following sounds is instructive:[34]

Source of Sound	Distance of Audibility
Gun Fire	up to 15 km.
Single shot rifle fire	up to 3 km.
Movement of tanks and tractor-drawn artillery	
on ground/dirt road	up to 2 km.
on highway	up to 3-4 km.
Trench digging (shovel striking against stones or iron)	up to 1 km.
Loud vocal commands	up to 500-1,000 meters
Talk	100 to 200 meters

Also related are the Soviet figures for the distance at which certain light is visible: a cigarette is observable at 100-200 meters, a burning match from 300 meters, and tanks or APC headlights are visible from 5 km. and more.[35]

Communications in the night defense is accomplished as much as possible by wire or personnal contact between commanders. Soviet writings specifically mention the danger of enemy "firing" on command nets' locations if the defense remains static in one area several days.[36] They also complain that infrared surveillance devices' ranges are insufficient for the demands of defensive night combat.[37]

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[34] LTC's R. Trofimov and V. Sheigin, "Preparation of Tank Company for Night Defense," Soviet Military Review, September 1971, p. 29.

[35] Ibid.

[36] Krzhibskii, op. cit., pp. 144-145.

[37] Ibid., p. 143.

CHAPTER III

TRAINING

The study of Soviet training as it is described in the military press is an important and revealing aspect of their night combat capability. While Soviet doctrine delineates what might happen under ideal or most desirable conditions, through a study of the many articles detailing training methods, one can more realistically appraise their probable actual level of accomplishment.

Of thirty-one articles appearing in Voennyi Vestnik, Soviet Military Review or elsewhere in the Soviet military press during the past four years, all but one described either individual training or unit drill (takticheskostrolevoe zaniatie), and the lone exception mentioned a battalion night operation during exercise Dnieper quite vaguely and only in passing.[1] While obviously this is not to say that Soviet units have not attained a higher state of training, it does at least suggest a more realistic appraisal of actual Soviet capabilities to wage this complicated and demanding warfare. Indeed, one sometimes has the impression that, whatever the special claims made for the importance of night combat on the modern battlefield by Soviet tactical doctrine, night training's major function as far as the same commanders are concerned is mostly to force troops to more fully master basic skills. Numerous night training articles start out with a warning to the effect that night training is not even to be contemplated until troops qualify in daylight norms

At this point, a closer examination of Soviet training methods for the various branches of arms is in order; motorized rifle, as the basic combat arm, will be studied first. Detailed preparation is probably the outstanding feature of Soviet night training. Approximately two weeks before a battalion level night firing exercise, unit training schedules begin to cover various skills that will be required. This is accomplished at squad,

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[1] COL I. Vorobyov, "Night Offensive," Soviet Military Review, June 1972, p. 13.

platoon, and company levels, with around half of this training conducted at night. Some sandbox training is used at initial stages, and small-caliber and pneumatic weapons are used for marksmanship training.

The exercise is conducted on a firing range with varied types of targets (popu-up and flash imitation) disposed in an order corresponding to "enemy" tactical formations. Normally, a tank company, engineer platoon, and CBR defense section are attached, just as they would be in combat.[2] Enemy "reconnaissance" elements are first engaged from alternate positions so as not to prematurely betray primary positions to enemy artillery and the main forces. Both flares and illuminating rounds are fired by supporting artillery or organic mortar elements, although use is also made of floodlights to illuminate distant targets. This is generally done from the rear to simulate the silouetting of battlefield targets by bursting rounds or fires in the enemy defensive area. As the troops gain experience, the illumination is gradually decreased until it corresponds more closely to battlefield conditions.

In a battlefield training exercise of this type, five training points or stations are characteristically established.[3] At the first three points, squad RPK light machine gunners and riflemen armed with the AKM assault rifles are trained. At the first point they are taught to engage moving and pop-up targets. At the second, they are taught to sight and "dry fire" upon stationary targets, throw grenades at illuminated targets, and checked to insure that established norms are met. At the third point they are trained to determine distance at night. At this point, a platoon live firing exercise is conducted with emphasis on well-integrated fire control at ranges from 100 to 500 meters.[4] At the fourth station, BTR gunners are taught to

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[2]LTC B. Shchitikov, "Noch'iu c Boevoi Strel'boi" (Night Combat Firing), Voennyi Vestnik, September 1972, p. 24.

[3]LTC E. Sokolov, "Iz Strelkonogo Oruzhiia Noch'iu" (From Infantry Weapons at Night), Voennyi Vestnik, February 1971, p. 93; COL A. Egorov, "Obuchenie Strel'be Noch'iu" (Night Firing Training), Voennyi Vestnik, January 1972, p. 102.

[4]Egorov, op. cit., p. 104.

fire the on-board machine guns at moving and pop-up targets, as well as to determine ranges. They are also tested on their ability to satisfy established "norms." At the fifth point, grenadiers are taught to engage moving targets representing APC's or tanks with the RPG grenade launcher, throw hand grenades, and estimate distance at night. A separate point is sometimes established where gunners from the company machine gun (PK) squad are trained separately,[5] and yet another point may be established for graded firing from pneumatic small caliber weapons. This is generally accomplished at greatly reduced ranges - as little as 20 meters.[6] Very often, snipers armed with the recently-developed Dragunov (SVD) 7.62 mm sniper rifle receive separate instruction in the engaging of enemy IR sources or illuminating means.[7] Significant portions of night firing training are conducted wearing gas masks and protective clothing.[8]

Before conducting a tank line-fire exercise, a Soviet unit will normally conduct at least 6-8 dry-firing training exercises, with as many as 5 of these occurring at night.[9] Direct preparation begins 7-10 days previous to the firing and one battalion commander reported spending as much as two months in preparation for the great event.[10] Before the actual firing, three training points are generally established for tank crews. At area number one, tankers carry out gunnery practice from rocking frame simulators. To simulate the dazzling effect of the main gun's discharge at night, electric bulbs are set to go off when the electric trigger is engaged. At the second point, crews carry out missions on gunnery simulators, making use of the training targets in the first area. The range chief controls

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[5] Ibid., p. 102.

[6] Ibid.

[7] Shchitikov, op. cit., p. 26.

[8] Egorov, op. cit., p. 100.

[9] Ibid., p. 101.

[10] LTC V. Akulovskii, "Pered Nochnymi Strel'bami iz Tankov" (Before Night Tank Firing), Voennyi Vestnik, December 1972, p. 99.

the appearance and movement of 25-30 targets displayed at various ranges. At the third area, crew members practice their individual functions. They also estimate distances and practice determining azimuths to various targets. After each crew has passed through the three points, they conduct live firing exercises during a "controlled drill." Sub-unit commanders pay special attention to the strict recording of results achieved during all phases on each trainee's record card.[11] Night firing is practiced with both night and normal range finders; as already mentioned, targets may be engaged at considerably greater distances with the daytime scope.

One article describing Soviet nighttime artillery training complained that too often the local training areas within the Group of Soviet Forces in East Germany used for this purpose were too small to conduct realistic training.[12] Furthermore, the entire area was well known to gun crews and forward observers. To offset this, the author recommended using different, arbitrary, grids for the same area, although this hardly seems a workable solution. At any rate, it is unlikely that live firing exercises could take place in such limited areas.

A typical artillery night training exercise would include both specialized and combined tactical training and last 6-7 hours, beginning an hour and a half to two hours before sunset so that tubes could be emplaced and surveyed and firing sections, platoons, or batteries set up before darkness.[13] At least two such unit training exercises are conducted each month, but one takes place during daylight hours.[14] Artillery units devote special attention to setting up and employment of artillery instrumental reconnaissance means since sound and flash ranging are particularly effective at night. One article

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[11] Krainov and Ruzanov, Soviet Military Review, p. 19.

[12] COL S. Kognovitskii, "Obuchenie Deistviiam Noch'iu" (Training for Night Operations), Voennyi Vestnik, January 1972, p. 56.

[13] Ibid., p. 58. LTC M. Mozharov, MAJ B. Krupenin, "Kompleksnoe Zaniatie s Batareei Noch'iu" (Combined Battery Training at Night), Voennyi Vestnik, February 1971, p. 50.

[14] Kognovitskii, op. cit., p. 49.

recommended that artillery reconnaissance training be centralized and be conducted at battalion or regimental level because of its complexity and the need for regular practice.[15]

Other themes covered during night artillery training include some "engineer training" (probably construction of gun emplacements and connecting trenches) and defense against "mass destruction" weapons, or CBR defense.[16] During all night exercises, light discipline is strictly maintained.[17]

Whithin all branches, night tactical movements constitute a significant portion of night training activity. While still a complicated feat, Soviet units enjoy the advantage of some fairly sophisticated navigational aides which are described in the following chapter. Before setting out, azimuth and distance data is worked out for each stretch of the route. Frequently, a unit commander will designate one or two observers to look for and report arrival at certain landmarks along the route. Using the vehicle's navigation equipment, the driver changes to the new course heading when the observers report arrival at the landmark. The driver may also determine distances covered with the speedometer. This is certainly no procedure for a novice driver, and it is likely that even a skilled driver requires constant practice to develop and build confidence in the system.

After a detailed examination of Soviet writing on the subject, one is left with the impression that the Soviet ability to wage warfare at night is considerably greater than our own, although by no means as high as a casual perusal of their military press might suggest. Many factors, ranging from the multiplication of confusion, complexity, and uncertainty at night down to the constraints imposed by the Soviet manpower procurement system contribute to this shortfall. This latter cause is more than likely the determining factor, since twice a year, in May-June and November-December, roughly 25% of combat and support troops

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[15] Ibid.

[16] Ibid., p. 49.

[17] Ibid., p. 52.

are replaced by new recruits, who in most cases have had only rudimentary pre-induction training.[18] This system essentially provides a Soviet commander with only half a year to build up his unit to a level under which coordinated, skillful night combat is a real possibility. As has been amply shown, night warfare is a most complex undertaking, and trying to achieve a viable capability in this regard must be a frustrating endeavor when twice a year a contingent of green troops comprising almost a quarter of one's unit arrive, forcing the commander to begin anew back at square zero.

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[18] CPT R. Zvyagelsky, "Recruits," Soviet Military Review, May 1972, p. 69.

CHAPTER IV

TECHNICAL AIDS FOR NIGHT OPERATIONS

As could be expected of a technologically advanced country, Soviet Armed Forces are equipped with a variety of infrared scopes and night vision aids for surveillance, driving and night firing. Moreover, recent press articles have disclosed that quantities of starlight scopes were captured from the Arabs during last fall's Arab-Israeli confrontation. It can, therefore, be assumed that Soviet and probably other Warsaw Pact Forces have been issued this equipment on a large scale.

Soviet and Warsaw Pact forces employ the NSP-2 night sighting device on assault rifles, light machine guns and shoulder fired anti-tank grade launchers. Its effective range is 200 meters; its maximum range 300 meters, and basis for issue is believed to approximate six per motorized rifle company -- which would make two available per platoon. For intermediate distances, longer range weapons such as company-level (PK) and heavy (DShK and KPV) machine guns mount the PPN-2 for acquiring, observing and firing on targets. Effective from 300 to a maximum of 500 meters, this lightweight system can also be used as a metascope to detect IR sources. It consists of an IR source unit, wet cell power pack, and viewing device. Each motorized rifle company is thought to have two of these systems.

The APN series of IR sighting equipment with a reported range of "several hundred meters" is employed on Soviet and Warsaw Pact recoilless guns, as well as anti-tank and field guns of 57-100 mm, for direct fire upon tanks or fortified positions. Similar night sighting equipment is known to be installed on medium tanks from the T-54 to the T-62 series.

On the T-54, an FR-82 filter is mounted on the conventional FG-10 tank headlight, providing a normal effective range of about 90 meters and a field of view of 29 meters at 50 meters.[1] In addition, the T-10M heavy tank and the ASU-85 airborne assault

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[1]US Army Intelligence School, Ft. Holabird, MD, SUP R 66152 (DINRI): Communist Weapons and Equipment Handbook (Fort Holabird MD: January 1969), p. 21.

gun also have on-board IR sighting and navigation systems.

Drivers of armored vehicles currently in use by Soviet and Pact forces use either the monocular TVN-1 or binocular TVN-2 infrared night driving systems. The range for the TVN-1 is quite limited -- reportedly, only 60 meters. However, a binocular headset - type device, the BVN-57, is also in service for navigating tracked vehicles, artillery vehicles, and a variety of normal and over-sized engineer equipment. Commander's surveillance devices are also used on tanks and most models of armored personnel carriers, as well as amphibious scout cars.

Finally, the Soviets supply their troops with field glasses equipped with an IR detection system and the same system is employed in the scope for the Dragunov (SVD) sniper rifle, both good passive detectors, with the latter also a capable "discourager" of undisciplined IR use on the part of any possible opponent.

According to recent Western press reports, the ranges of Soviet starlight scopes captured by the Israelis during last fall's Yom Kippur War are significantly greater than the IR equipment just surveyed. One scope could reportedly detect movement of individual troops at 800 yards, while it could pick up vehicle movement out to 1800 yars. An article published recently in Army Times disclosed that the U.S. Army has increased emphasis on the procurement of night sights for anti-tank missiles, as well as night vision goggles for infantrymen and tankers, as a result of the equipment taken from the Arabs, the number and variety of which reportedly surprised US intelligence officials.

Possibly of even greater interest is the extensive Soviet use of some rather technically advanced navigational equipment to facilitate movement during periods of darkness or reduced visibility.[2] This equipment comes in three configurations: the most basic consists merely of a directional gyroscope, the second includes both coordinate and course indicators, and

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[2]All data for this section is derived from A. M. Govorukhin and M. V. Gamezo: Sprovochnik Ofitsera po Voennoi Topografii (Military Topographic Officer's Handbook) (Moscow: Military Publishing House, 1968), particularly Chapter VIII, "Primenenie Navigatsionnoi Appartury pri Orientirovanii" (Use of Navigation Apparatus for Orientation), pp. 201-226.

the most sophisticated, found in command vehicles, features a console which actually plots the vehicle's course on a topographical map. The equipment is also useful in forested areas, in cities which have suffered extensive destruction, and in desert or steppe areas where prominent terrain features are lacking. One Soviet publication has also mentioned that the equipment is expected to be quite useful in areas which have been devastated by nuclear strikes.[3]

Many Soviet combat vehicles, including all medium tanks and scout cars (BRDM), carry either GPK-48 or GPK-59[4] gyroscopic compasses (directional gyro) which accurately reflect the vehicle's course (azimuth) within 2° for periods of up to 1.5 hours before it must be resurveyed. According to Soviet manuals, if special care is taken in surveying the start data, the machine may be used up to five hours before a re-check of the vehicle's location is required. The gyrosoope is connected to the vehicle's universal joint in such a way that it reflects the change of direction whenever the vehicle turns.

The gyroscope may be switched on only with the vehicle motionless, and it must remain stationary for at least five minutes while the operator goes through a detailed check-out procedure (see Appendix I). Before setting out, the directional angle or magnetic azimuth of the vehicle's longitudinal axis must be determined and entered into the gyro. Basically, there are three methods for surveing the vehicle. None are very complicated or time-consuming and they are described in Appendix I.

Not only must the vehicle remain in place during a five-minute warm-up period, but failure to switch off the gyro's braking mechanism before setting the vehicle in motion also results in equipment breakdown. There is unfortunately no material available concerning maintenance or equipment "down time," but on the surface it does appear somewhat vulnerable in this regard.

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[3]COL A. Krylov, "V Usiovilakh Ogranichennoi Vidimosti" (In Conditions of Limited Visibility), Voennyi Vestnik, July 1973, p. 39.

Prior to movement, vehicle commanders must plot out their route of march on a map and prepare data tables giving distances and various azimuths along the route. The driver determines distance covered on a speedometer, and when the distance indicated by the table is reached, he turns the vehicle, with the gyrocompass determining the prescribed angle. Enroute, the commander checks the location of observable landmarks against his map. As previously indicated, Soviet doctrine stresses that, conditions permitting, the gyrocompass base angle should be rechecked every 1.5 hours, definitely before five hours of use.

Articles in the Soviet press indicate that the Soviets place great emphasis on the use of this equipment on night marches. As far as can be determined from open sources, the system is a good deal more feasible than it sounds. One of the Soviets' more interesting application of the gyro is to maintain course during tank snorkeling operations, and at least one article has also described an assault by a tank battalion guided only by gyrocompass.

The navigation equipment package without console is found predominantly in artillery units, where it is used extensively to establish survey data[4] -- which fact alone would seem to reflect the mechanism's accuracy. The system's components include: (1) gyroscopic indicator, (2) control panel, (3) route indicator, (4) coordinate display, (5) two course indicators, and (6) a transformer. Average error is no more than 1.3% of the course covered; the set's gyro is accurate to within $\pm$ 20' over a half-hour period.

Approximately 10-15 minutes is required to ready the equipment for operation, and it may be used continuously for up to 3.5 hours before it should be resurveyed. If the march is of greater length, Soviet doctrine stipulates that several terrain features, preferably near rest areas, should be pre-selected for re-orientation of the set. No matter what the length of the march, the map is "prepared" beforehand. The required sheets

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[4]MAJs E. Krylov and Sch. Balaban, "Orientirovanie Tanka po Kompassu," Voennyi Vestnik, November 1972, p. 43.

are glued together and distance and azimuth readings worked out. For off-road movement, especially at night, the map is annotated with all directional angles and distances. A Soviet sergeant writing in Voennyi Vestnik stated that on a march involving only 4-5 turning points, 15-20 minutes is needed to compute the route data. In true Soviet inventors' and rationalizers' tradition, he developed a plastic calculator to accomplish the computations much more rapidly. Using the course indicator and speedometer, the driver can navigate, although he must stop every 10-20 minutes to check his position. Apparently, the Soviets use GAZ-69 jeep-like vehicles equipped with this navigational configuration to lead columns during night marches--the others "following the leader" under blackout conditions.

When entering coordinates into the mechanism, care must be given that the knob is turned only from plus to minus values, since otherwise there will be play in the kinetic chain and inaccuracy will ensue. Also, the equipment's accuracy is markedly decreased under conditions of ice, deep snow, or in swamps, due to spinning of the vehicle's wheels.

The final Soviet navigational configuration,* usually found in BTR-50 PU command vehicles, includes a map plotting console, plus course and route indicators. The error of the gyroscopic course indicator is, according to Soviet writings, $\pm$ 20' per hour. The apparatus continuously provides the vehicle's coordinates and the azimuth along which it is moving while plotting the route as it is covered. Map scales of 1:25,000, 1:50,000, and 1:100,000 may be used with the equipment -- a good guess would be that these correspond to battalion, regimental, and divisional and higher echelons. Two map boards are provided so that the next map can be prepared as the plotter approaches the edge of the first.

Once set in motion, the apparatus is supposed to be turned off only when the vehicle is stopped. The gyrocompass requires 4-5 minutes to come to a halt once it has been switched off. However, if the situation is such that the vehicle cannot stop,

*See page 40 for illustration.

the remainder of the apparatus can be switched off while the gyrocompass remains operating.

Admittedly, a number of questions remain unanswered in this rather important area of navigational equipment. Of paramount interest are hard data on the system's accuracy under actual field conditions and the actual "state of the art" of its employment by Soviet troops. Also of importance is the scale of their deployment -- this paper has given at best only estimates. On the whole, though, each of the three configurations appears to be a useful aid which considerably enhances Soviet night movement, and in some cases, tactical deployment, capabilities. This is a system for which U.S. forces have no equivalent.

CHAPTER V

ASSESSMENT OF SOVIET CAPABILITIES AGAINST THOSE OF THE US ARMY

The Soviet Army is hardly unique among modern armies in its insistence that on any future battlefield, troops must be prepared to conduct a sizeable portion, perhaps even the bulk, of combat operations at night. The basic US handbook of night combat, FM 17-1, and other reflections of our doctrine, stress the advantages of surprise and reduced casualities which accrue to forces attacking or defending during periods of darkness. However, our doctrine is somewhat less demanding -- and perhaps objectively more realistic -- than the Soviet. No requirement is made by US manuals to maintain daytime rates of movement at night, and our doctrine advocates night assaults only for limited objectives,[1] often to seize favorable terrain for a succeeding daylight operation.[2] Our formulations of night offensive doctrine appear somewhat ambiguous, but they do not speak in terms of relentless pursuit of withdrawing enemy formations as do Soviet military publications.

> Successful attacks can be made at night on an impromptu basis, but the risk of failure is greater. Attacks in progress are not discontinued merely because of nightfall. Subordinate units in the attack plan to continue the attack through the night unless ordered otherwise.... Attacks launched during early darkness, however, permit the attacker to take maximum advantage of a long period of darkness and exploit the enemy's confusion and loss of control. Attacks may be initiated during darkness and continued without pause during daylight.[3]

It should be noted that there seems to be insistence that the attack be continued "without pause" only during daylight hours.

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[1] RTCM-145-60, Small Unit Tactics (Washington: HQ Department of the Army: June 1964), p. 167.

[2] RM 61-100, The Division (Washington: HQ Department of the Army: June 1965), p. 72.

[3] Ibid. For a Soviet appraisal of US doctrine, see Appendix II.

In the final analysis, doctrine is not as important as an army's actual practices and capabilities -- but both, unfortunately are far harder to determine, not only for the Soviet Army, but for our own as well. Training levels in all armies vary sharply from one unit to another; certainly, much depends on the individual commander and the emphasis he places on various aspects of combat readiness. As already mentioned, Soviet writers state that significant portions of combat training should occur during hours of darkness. US Army Training Programs (ATPs) specify that one third of all training be conducted at night. However, implementation of this directive is an entirely different matter, and one career infantry officer has estimated that the average American troop unit probably devotes no more than fifteen per cent of total training time to night operations.[5] The US Army's relative lip service to night combat is further reflected in the amount of night training given recruits in Basic and Advanced Individual Training -- two nights out of an eighteen week period.[6] Furthermore, comparatively little night training is given during ROTC summer camp -- two nights during "Tac Week" out of a six-week period -- as well as in the Infantry Officer's Basic Course -- perhaps 4-5 night training activities or problems during a nine-week course.[7]

Much conspires against a commander's possible desire to give his troops more night training in our post-industrial, somewhat pampered, and "permissive" society. But even when our troops are sent to the field, daylight operations are the norm, when the demands of future, potentially nuclear, battlefields would seem to demand the reverse.

As far as actual night combat experience, the United States Army would on the surface appear to enjoy quite an advantage.

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[4]Conversation with LTC William C. Dukes and LTC Palmer McGrew, II, both Infantry Officers and classmates at the Russian Institute, 22 February 1974.

[5]LTC McGrew, 22 February 1974.

[6]CPT John C. Reppert, Russian Institute, 22 February 1974.

[7]Personal recollection from July-August 1965 and September-December 1966.

After the Chinese intervention in the Korean Conflict, most operations conducted by the United Nations Command were launched during hours of darkness. Even more recently, many of our units in Vietnam regularly operated at night. Indeed, Special Forces units were at one time forbidden to operate during the day.[8] However, US-conducted night operations in the Republic of Vietnam were almost exclusively company and smaller night ambushes, and their relevance to the likely character of any probable warfare in the European theatre is open to doubt. Very few -- one could almost say no -- motor marches were conducted by American forces in Vietnam during period of darkness.

The Soviet Army, of course, has had no combat experience subsequent to World War II. However, their training program is characterized by vigorous insistence that all exercise problems approximate to the greatest extent possible those conditions which would be encountered in actual combat. The Soviet Army is a <u>field</u> army in the very real sense of the word.

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[8]LTC Dukes, 22 February 1974.

CHAPTER VI

CONCLUSIONS

There is little doubt that night warfare has acquired great significance with the advent of the generally accelerated pace of modern warfare. Soviet military literature is replete with evidence that their commanders are aware of and plan to capitalize on the advantages which accrue to troops well schooled in the specialized techniques of combat at night and during periods of reduced visibility. A study of Soviet military doctrine suggests that night operations would predominate in any possible future conflict. Furthermore, their improved capability for night combat probably contributes immeasurably to the high rates of advance projected by Soviet planners which often seem so fantastic to Western analysts.

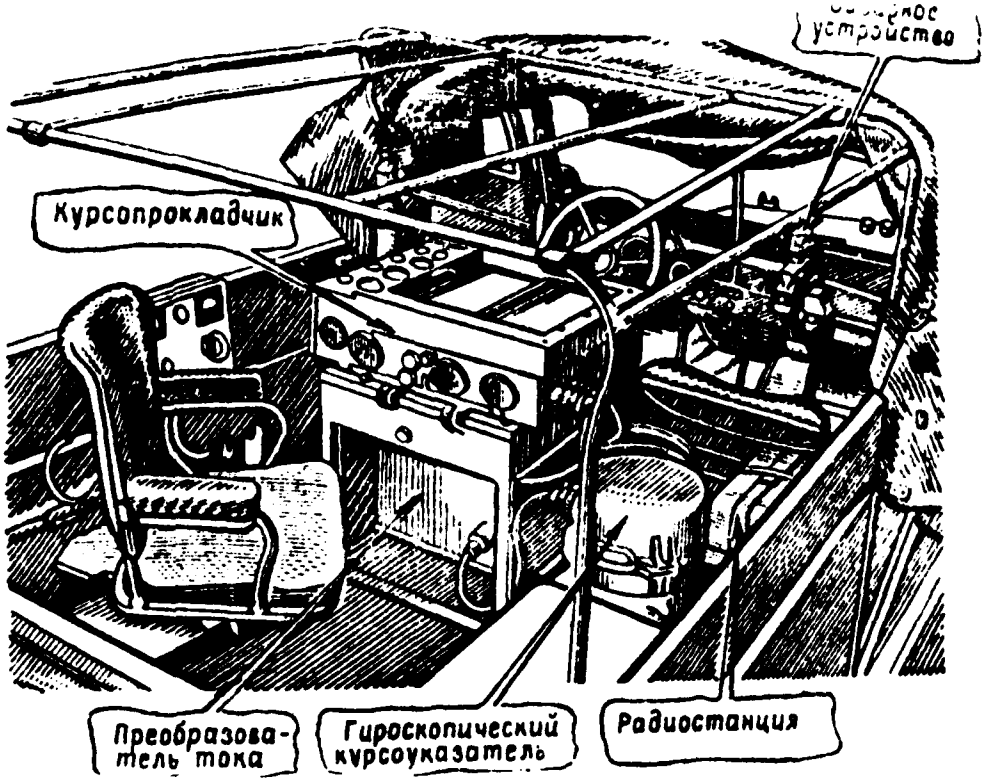
It is obvious that the implications and demands of night combat as they bear on each separate branch of arms in turn have been given detailed consideration by Soviet military thinkers. Night combat appears to be one of three "most favorite" themes appearing in Soviet military journals -- the other two being the meeting engagement (approach to contact) and river crossing operations. On the other hand, despite Soviet forecasts that night combat will be conducted at divisional and higher echelons as well, the absence of material covering even regimental actions at night seems to suggest that battalion level operations mark the present limit of the Soviet"state of the art."

Although Soviet training programs emphasize night operations, it must be remembered that the induction cycle is probably the most significant constraint placed on the achievement and maintenance of "ideal" levels of preparation for night actions. Once again, the lack of really "hard" data makes any positive assessment of Soviet night combat capabilities quite difficult, but it is evident at least that they fluctuate with the bi-annual induction cycle.

In the area of technology, the Soviets certainly have reason to be proud, as their troops are equipped with considerable quantitites of quality hardware. Soviet troops have both starlight and infrared systems to aid in night movements, observation and sighting. Moreover, the three configurations of Soviet land navigation equipment endow Soviet reconnaissance, armor, artillery and command and control elements with a considerable advantage vis-a-vis any opponent not so equipped.

Soviet troops have not engaged in sustained combat operations, night or otherwise, since the Second World War. However, they do place a high degree of emphasis on approaching combat conditions to the maximum extent during all training situations. On the balance, US experience in the Korean War and in Vietnam probably represents an at least limited advantage in this area.

In conclusion, no matter how critically one examines their ability to conduct night operations, it appears that the Soviet Army possesses capabilities which appear to considerably exceed those of the United States Army. This is a serious stateof affairs in a world where nuclear warfare, or certainly the use of mass destruction weapons, cannot be discounted. Night warfare is an aspect of modern combat which should receive greatly enhanced emphasis in the modern, professional United States Army. With our greatly reduced numbers, we cannot afford to abrogate or ignore the advantages of surprise, economy of force, and, most of all, of greatly reduced casualties which accrue to forces well trained in all the diverse and demanding techniques of night combat.



SOVIET MAP PLOTTING CONSOLE

See A. M. Govorukhin and M. V. Gameze, Spravochnik Ofitsera po Voennoi Topografii (Military Topographic Officer's Handbook), Moscow: Voennoe Izdatel'stoe, 1968, pages 202, 205, 207, 208, 209, 211, 216, 218, 219, 220 and 221 for additional diagrams.

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APPENDIX I

Gist Translation of Chapter VIII, "Primenenie Navigationnoi Apparatury pri orientirovanii" (Use of Navigational Apparatus for Orientation) in Spravochnik Ofitsera po Voennoi Topografii (Military Topographic Officer's Handbook), pp. 201-226.

1. Gyroscope (Directional gyro). The gyroscopic compass, installed in a variety of vehicles, is accurate within 2° for periods of up to 1.5 hours, when it must be readjusted. If the apparatus is carefully adjusted at the start, it may be used up to 5 hours before readjustment is necessary.

The machine functions by the movement of a scale connected to the universal joint of the vehicle which indicates a change in degrees whenever the vehicle turns. The gyrocompass can be switched on only if the machine is not in motion. Then the apparatus must be tested in the following order:

1. The apparatus must be oriented by turning the knob marked "arretir" to the position "push" (ot sebia).

2. Check the voltage of the electrical system - it should not be less than 24 volts.

3. Turn the on-off switch to "on."

4. The required azimuth is set on the scale using the floating dial.

5. The apparatus is braked by turning the tuning knob until a click is heard.

The machine may not be moved for at least 5 minutes after it has been switched on. Before starting out, insure that the gyro brake has been switched off because if it isn't, it could cause a breakdown.

The vehicle's base reading is determined from the directiona. angle (magnetic azimuth) of its longitudinal axis in one of three ways:

1. If the movement will be accomplished in one pre-determine established direction, the vehicle is so positioned so that the

cross-hairs on the sighting devices are pointed at the selected landmark. The turret must be situated in the 0° (or 30°) position. After the vehicle has been thus oriented, the gyroscopic compass is switched on and the dial is set at 0°.

2. The second method is used when more than one azimuth will be followed during the march and the longitudinal axis of the machine can be determined on a map. The vehicle is placed along a linear terrain feature shown on the map, from which is visible some distant landmark. Using a protractor, the angle (a_{or}) between the machine's location and the landmark is determined. The cross hairs of the vehicle's sight are laid on the distant terrain feature and the angle of sight (a_{viz}) is calculated. The directional angle of the longitudinal axis ak is calculated according to the formula:

$$ak = a_{or} - a_{viz}$$

3. When the gyrocompass will be used for more than one azimuth, but visibility is poor or there are no suitable terrain features, the magnetic azimuth of the longitudinal axis (ak) is determined thus: at a point about 50 m from the vehicle use a compass or aiming circle to determine the magnetic azimuth to the center of the turret or to the sight. Lay the sight on the compass and compute the angle of vision (a_{viz}). The azimuth of the vehicle's longitudinal axis is calculated Ak = Am + 30-00-a_{viz}. The angle of the longitudinal axis is then set on the scale of the gyrocompass, after which, having disengaged the gyro's brake, the vehicle can be set in motion.

4. Driving the machine by gyrocompass. The route of march must be marked out on the map in advance and the necessary data prepared indicating either directional angles and distance, or magnetic azimuths and distance. If the march lasts longer than 1-1/2 hours, the gyrocompass base angle should be periodically rechecked. Distances are determined by the speedometer and when the required distance indicated by the march table is reached, the vehicle turns, with the gyrocompass determining the proper angle.

2. Navigation Device without Console

This navigating device is intended for determining the location of moving vehicles in conditions of limited orientation, when the vehicle is to be driven over a given course. The set includes (1) a course indicator, (2) a control panel, (3) a route indicator, (4) a coordinate indicator, (5) two course indicators, and (6) a transformer. The components of the set insure the uninterrupted calculation of rectangular coordinates indicating the location of the moving vehicle and its course. Average error is no more than 1.3% of the distance covered. Preparation time is 10-15 minutes, and the equipment may be used continuously for up to 3.5 hour periods.

The face panel of the coordinate indicator has two horizontal scales giving x and y coordinate readings, two circular dial scales giving the course, and another scale, giving route corrections.

Determining the base reading. The initial orientation of the vehicle is accomplished by determining the directional angle of the longitudinal axis and the rectangular coordinates. Initial data are determined as a rule with 1:50,000 or 1:100,000 scale maps by first selecting a starting point represented on the map accessible to the vehicle (a crossroads or road fork, bridge, tower, geodedic survey marker, etc.). From this point some prominent landmark must be visible - but it can't be closer than 6 cm in the map's scale to the departure point. Using a protractor measure the angle direction ^{a}or as accurately as possible for the rectangular coordinates. The vehicle is placed in such a position that the azimuth mechanism in the vehicle's turret is situated in the center of the start point, or at least as close as possible to the point in alignment with the landmark selected. With the vehicle's azimuth sighting mechanism sight on the feature and calculate the angle of sight (^{a}viz), then figure out the starting direction angle of the vehicle (^{a}start) by the formula $^{a}_{start} = {}^{a}$or-^{a}viz. This initial directional angle must be determined as accurately as possible, since it largely determines the set's overall accuracy. It is worth selecting

two different landmarks and double checking - the results should not differ more than 4'. For greater accuracy, use the average of the two figures. And if the error was more than 4', repeat the operation. At night and in areas where visibility is restricted, the set is oriented using an aiming circle set up at least 50 meters from the vehicle. Sight on the azimith mechanism and determine the angle to it. At the same time the magnetic reading from the vehicle's azimuth reading mechanism to aiming circle is shot. The starting direction can then be determined by adding the angle from the machine to vehicle to the direction correction taken from the map (declination diagram), plus 30° minus the angle between the direction of the vehicle's longitudinal axis and the direction of the aiming circle.

Preparation of the navigation set for operation. The voltage must be checked (at least 24 volts) before the transformer can be switched on. After 10-12 minutes the main system can be switched on - for this the "receiver of synchronized transmission of angle" is set at the same position as the course indicator, and the indicators on the "course" scale occupy a corresponding position. Now the following data are set on the machine: start (initial) coordinates, initial directional angle, and the coefficient for course correction.

To enter coordinates, press the button until the desired numbers appear and insure that the number is centered in the opening. This must be done only in the direction plus to minus, since otherwise there will be play in the kinetic chain. The coefficient for course correction is determined by driving over a 1000 meter course in advance or is established from data determined from similar courses.

The navigational apparatus itself may be switched on only in a motionless machine. About 15-20 minutes are required before the gyroscope rotor in the course indicator stops -until it does stop completely, the machine cannot be moved.

Procedure of orientation during motion. Before the vehicle starts out, the topographical map is prepared - the necessary sheets are glued together, the route is marked out, and the required data are worked out (distance and azimuth readings).

If the march is 3.5 hours in length or more, several contour points and landmarks should be selected, preferably in rest areas, so that the navigational apparatus can be reoriented.

For off-road movement, especially at night and during bad visibility, as well as in cities which have suffered mass destruction, the map is prepared giving all directional angles and distances. Using the course indicator and speedometer, the driver can navigate, but every 10-20 minutes, as well as at all turning points, the coordinates shown on the apparatus must be checked with the vehicle's location. They are readjusted accordin

If the route cuts across into the adjacent map sheet, and ontc a new grid, the machine should be stopped and reoriented all over again. If this is impossible, movement can be continued if secondary coordinates have been entered along the edges of the sheet. The machine should be reoriented as soon as possible, but no later than 3.5 hours after the apparatus has been switched on.

3. Orientation Using the Navigation Apparatus with Console. Basic elements. This system provides uninterruptedly the vehicle's rectilinear grid location and direction azimuth (course) and also displays on the map the course as it is covered. It includes the following basic components: course indicator, route indicator, course plotter, transformer, engine generator.

The error of the main axis of the course indicator's gyroscope is no more than $\pm$ 20' per hour. The route indicator provides continuous synchronized transmission to the course plotter of the route covered by the vehicle. The plotter continuously provides the coordinates at which the vehicle is located and the azimuth along which it is moving while plotting the route as it is covered. Map scales which may be used on the plotter are 1:25,000, 1:50,000, and 1:100,000.

Procedure for operating: Determine start position as previousl described. Before switching the navigation apparatus to on, check to see that the phase switch on the transformer is switched off. The brake handle on the course indicator should be in the "brake" position. The vacuum meter should indicate no less than

70 units in the gyro-motor's chamber. The vehicle's voltage should be 27 $\pm$ 2.7 volts. Now the phase switch can be flipped on, the "amber" switch provides current to the generator which also lights up the "stop" (brake). In 5 minutes the "brake" light goes out and the brake is released; ten minutes later the generator motor is switched on using the "route (trassa)" switch. Then the amplifier switch on the side panel of the course plotter is turned on, followed by the "route switch." Using the illuminator reostat, set the necessary brightness for reading the map and scale. After the start data has been entered the vehicle can be set in motion. Accuracy of the plotter can be determined while traveling over a straight road. For example, if after one kilometer on a 1:100,000 scale map the tracing pencil has moved 1 millimeter off the road, the correction for directional angle would be 1°. If the deviation is to the right of the road, decrease the directional angle; if to the left, it should be increased.

There are two map boards so the next map in series can be readied before the plotter reaches the edge of the first. The vehicle must be stopped while the plotter is reset to the vehicle's location on the new sheet. After checking that the map scale is set properly, the vehicle can start out again. The apparatus can be turned off only if the vehicle is stopped. The gyrocompass requires 4-5 minutes to brake once it has been switched off. However, if the situation is such that the vehicle cannot stop, the apparatus is turned off but the gyroscope can remain on.

APPENDIX II

Translation of "Combat Actions at Night, according to US Tactical Doctrine"[1]

Divisions, brigades, battalions and lower level units of the U.S. Army systematically prepare for theconduct of active, uninterrupted combat operations night or day.

The U.S. military press emphasizes that "movement, attack, the development of success and defense at night have become normal forms of combat."[2] Thus about a third of U.S. forces' training time is spent training for various means of night combat.

The night attack, according to U.S. doctrine[3] can be conducted to continue on operation begun during the day, develop successes, seize key terrain, etc. Complicated maneuvers requiring changes in the direction of attack in the course of battle are not recommended.

The decision to conduct a night assault must be taken beforehand to allow sufficient time for reconnaissance, detailed planning, and organization or coordinated actions.

If the assault is designed to seize favorable ground necessary for later daylight actions, it is normally conducted just before dawn.

When brigades and lower level units are given the mission to seize and hold a definite area, the attack may begin in the evening, so that the attacking forces can fortify the seized area by dawn.

The forcing of water obstacles is planned so that combat engineer units can begin the assembly of bridges as soon as it gets dark and the greater portion of the period of darkness can be used for the troops' crossing.

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[1] COL A. Ryzhkov, "Boevye Deistvila Noch'iu," Voennyi Vestnik, February 1972, pp. 118-122. The remaining footnotes in this Appendix are as given in the article.

[2] Army, August 1969.

[3] Military Review, December 1970.

To support combat operations at night, signal and artificial illumination means are used, as well as night vision devices (IR) and radio-technical (Signal Intelligence) designed to detect the enemy and survey the battlefield.[4]

Divisional and lower units can go over to the offensive at night either from the march or from positions of direct contact with enemy units. In the former case, the deployment of units from concentration areas to lines of deployment is accomplished in march formations along previously selected routes marked by lighted beacons. Two to four separate routes are used by each division. When nuclear weapons are employed, limits of safe distance from the enemy FEBA are greater (by 8-15 kilometers) than in daylight to protect personnel from the effects of light radiation of their own weapons.

An assault from contact can be carried out with no regrouping or only partial repositioning and relief of forces. It can also be accomplished by leapfrogging of units past those already in contact with the enemy.

Combat formations during night offensive operations are such that nuclear strikes can be rapidly exploited, while they also provide defense against enemy strikes. Depending on the situation, divisions (brigades) may be deployed in one, two, or even three echelons. If the mission is not deep, the formation may be only one echelon. Such deployment permits the striking of a strong initial blow and at the same time rupture of the enemy defense, considered highly desirable at night. For assaults along the main direction the most normal deployment is two echelons.

A mechanized infantry battalion attacking in the first echelon deploys in one or two echelons. In order to obtain the most effective use of organic and attached subunits, the battalion CO may form company-sized task forces (mechanized infantry-armor or armor-mechanized infantry).

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[4] Voennyi Vestnik, August 1968.

When creating task forces for operations one should consider that introduction of second elements into night combat is quite difficult. Therefore the attack, in the opinion of American military specialists, should be so organized that first echelon forces can independently defeat the strongest enemy groupings and seize ground which favors the introduction of second echelons and forceful development of offensive operations at dawn. However, the introduction of divisional or brigade second echelon units during periods of darkness is not excluded.

The depth of combat missions received by divisions and other units and the width of the front for night assault or breakthrough are more often the same as during daylight.

In contrast to daylight operations, units are given not only immediate and definite objectives, but also intermediate ones. This is considered necessary for far more reliable control.

The rate of attack is determined mostly by the nature of the enemy's defenses, terrain, visibility conditions, and in all situations is set as less than during daylight operations.

Artillery, along with its normal missions, destroys enemy illumination means and night vision devices, blinds enemy OPs, illuminates terrain and objectives with illuminating rounds, and places lighted points of reference for attacking units to guide on.

Aviation, besides its basic missions, is used to illuminate the most important objectives and creates landmarking fires in the depths of the enemy defensive zone.

Fire support during the night assault is organized beforehand. Missions of field artillery and tactical aviation should be assigned during daylight. Targets for nuclear strikes are also as a rule selected during the day.

Fire support for a night attack should begin with a sudden blow upon enemy objectives located in the first defensive belt of front line divisions. It, as daylight attacks, begins with nuclear strikes. Then a 15-30 minute artillery preparation follows.[5]

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[5] Infantry, May-June 1969.

According to U.S. military experts, in some cases there will be no artillery preparation to achieve surprise. In such a situation fire is planned to deny withdrawal of defending units to prepared positions deeper in the defensive zone.

After the artillery preparation and shift of fire to the depths of the enemy defensive, fire support of the attacking forces begins. In this period first echelon subunits are not supposed to become engaged in protracted combat, by-pass strong points, and advance rapidly.

Using all technical means available for night combat, destroying enemy heavy weapons and centers of resistance, the attack is developed forcefully and without interruption.

As the attack develops, coordinated action of armor and mechanized infantry mounted on APCs assumes primary significance. It is emphasized that control of armor and other units becomes difficult, as does their interplay with other combat arms.

The basic difficulties which armor units experience in night combat are greatly limited visibility, difficulty in navigating, and thus reduced speeds. Poor visibility hampers the maneuverability of tanks and reduces the effectiveness of armed fire. Regardless of this, it is considered possible to use armor units in first as well as second echelons.

The presence of tanks in the first echelon increases the force of the initial blow, enables more effective exploitation of nuclear strikes and the development of a forceful attack in depth. Attacking in the first echelon, tanks as a rule act in conjunction with mechanized infantry in so-called task forces. In the opinion of military specialists, this insures the most effective coordination as well as protection of armor from anti-tank weapons.

It is recommended that task forces attack in unit column and deploy in combat order only when necessary. Close communication is maintained between columns and measures are taken to preclude collisions between them.

For recognition of friendly forces, white or luminescent markers on APC's and tanks are used, and personnel wear white armbands or removable luminescent markers.

To insure rapid and decisive movement, maintain the right direction of attack, avoid collisions and provide mutual fire support, it is recommended that commanders be located with forward elements.

Brigade and battalion reserves are so situated that when necessary they can quickly develop successes or relieve attacking units.

The division second echelon (reserve) is usually engaged after the accomplishment of the immediate mission to develop the attack and maintain its rapid speed, link up with airborne or airmobile operations, or repulse counter attacks. Second echelon forces are also used in gaps and along flanks of first echelon brigades or battalions. When so engaged they are supported by artillery fire and air strikes using conventional as well as nuclear rounds. Terrain is illuminated.

Tactically important objectives seized in the course of night combat are immediately reinforced and defended.

Airborne troops may be used to seize key objectives in the depths of enemy defenses and hold them until link -up with attacki forces.

In the opinion of U.S. commanders, night is favorable for tactical air landings, decreases their vulnerability and makes it harder for the enemy to combat them. All this increases their effectiveness and enables them to conduct operations in the enemy rear longer than during daylight.

It is envisioned that tactical air landings will be undertaken not only in areas of nuclear strikes delivered by the attacking forces, but also near important objectives not suited to nuclear strikes. In this case it is considered possible to land directly on the objective or close by, expecting a link-up by dawn.

Night Defense in Short.[6] Night defensive actions of divisions and lower units of the army are basically like those conducted in daylight. However, weapons employment and support of the night defense have a lot of peculiarities. In night-

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[6] Infantry, March-April 1968.

time defensive areas fire support means and reserves are closer to the FEBA, flanks are reinforced, etc.

In night divisional and brigade exercises and maneuvers, mobile as well as area defense may be employed. Here troop deployments are little different from day-time tactics. It is envisioned that attacking enemy forces will be destroyed by nuclear weapons and other means beginning at the far approaches to the defense. Covering forces and security elements using atomic demolitions, minefields and widespread destruction, by fire and counterattack contain the enemy advance so that the main forces gain time to prepare the defensive. Forces deployed in the security belt generally conduct delaying operations.

The successful conduct of delaying operations, in the opinion of U.S. military commanders, depends to a great extent on detailed prior planning, firm command, initiative of covering and security forces, and also on radio-electric and illumination support.

Covering forces, holding a number of positions astride the main axis in turn, conduct delaying operations up to the General or Combat Outpost line. Upon their withdrawal from that line they revert to the reserve of their commander. In such circumstances it is deemed appropriate to employ nuclear weapons to destroy the enemy or disrupt his deployment. The delivering of nuclear strikes is a signal for covering forces to withdraw to the next line.[7]

At night great attention is paid to artificial illumination and electronic reconnaissance means.

Illumination is used during preparation of defensive positions and while conducting terrain reconnaissance. According to specialists, this permits improved selection and employment of artillery and missile positions, foxholes and shelters, and easier preparation of nuclear minefields and other obstacles. Artificial illumination favors the conduct of counterattacks supported by

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[7] Army, August 1969.

artillery and machine gun fire; evacuation of wounded from the battlefield; facilitates deployment into launch positions and control of missile units; and also limits enemy reconnaissance, sabotage and diversion activity, while hampering the conduct of enemy attacks.

The decisive stage of night defensive combat is considered to be a counterattack by divisional or corps level reserves. Their basic goal is the destruction of enemy forces, seizure of the initiative, and creation of favorable conditions to go over to offensive operations.[8]

The order and capabilities for illumination support of counter-attacking forces at night is similar to the introduction of second echelons into the attack. The counterattack may be preceded by a fire preparation using nuclear as well as conventional means.

If superior enemy forces penetrate in depth into the defense and it is not possible to stop their advance, divisions and subordinate units go over to withdrawal operations in order to gain time and organize a defense along a more favorable boundary.

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[8] Military Review, December 1970.